CLAIMS

We claim:

1. A method for timing recovery in an orthogonal frequency division multiplexing (OFDM) system, comprising the steps of:

detecting a lack of a synchronization symbol;

determining a timing offset from calculating the Average Group delay over a set of OFDM symbols;

feeding back the timing offset to a demodulator; and

adjusting the symbol timing based on the Average Group Delay fed back to the demodulator.

2. The method of claim 1, wherein the step of determining the phase offset further comprises the step of determining the phase offset directly from the OFDM symbols using a discriminator in a feedback loop.

3. The method of claim 1, wherein the step of determining a phase offset comprises the step of using a phasor to estimate the average delay of a multi-carrier modulation symbol.

4. The method of claim 1, wherein the step of adjusting the symbol comprises the step of adjusting the symbol timing towards a target phase rotation.

5. The method of claim 1, wherein the method further comprises the step of maintaining symbol synchronization without ever detecting the synchronization symbol.

6. A method for timing recovery in an orthogonal frequency division multiplexing (OFDM) system, comprises:

detecting a negative phase in a OFDM modulated signal;

narrowing a search window for the synchronization symbol; and

adjust timing to an earlier arriving signal detected by a synchronization symbol recovery detector.

7. A method for timing recovery in an orthogonal frequency division multiplexing (OFDM) system, comprises:

detecting a negative phase;

disabling a synchronization symbol recovery algorithm; and

adjusting the phase until a non-negative phase is detected.

8. A digital receiver unit, comprising:

a receiver;

an orthogonal frequency division multiplexing demodulator; and

a processor coupled to the receiver and the demodulator, wherein the processor is programmed to:

detect a lack of a synchronization symbol;

determine a phase offset from a set of OFDM symbols;

feed back the phase offset to the demodulator; and

adjust the symbol timing based on the phase offset fed back to the demodulator.

9. A digital receiver unit of claim 8, wherein the digital receiver unit further comprises a phase detector coupled to the processor, wherein the phase detector detect the phase offset.

10. The digital receiver unit of claim 8, wherein the processor is further programmed to determine the phase offset directly from the OFDM symbols using a discriminator in a feedback loop.

11. The digital receiver unit of claim 8, wherein the processor is further programmed to determine the phase offset using a phasor to estimate the average delay of a multi-carrier modulation symbol.

12. The digital receiver unit of claim 8, wherein the processor is further programmed to adjusting the symbol timing towards a target phase rotation.

13. The digital receiver unit of claim 8, wherein the processor is further programmed to maintain symbol synchronization without ever detecting the synchronization symbol and only using the phase offset.